

UNITED STATES  
ENVIRONMENTAL PROTECTION AGENCY  
REGION 6

	)	
IN THE MATTER OF:	)	U.S. EPA Region 6
	)	CERCLA Docket No. 06-07-17
Griggs and Walnut Ground Water Plume	)	
Superfund Site, Las Cruces, New Mexico	)	
	)	
City of Las Cruces, and Doña Ana County	)	
	)	
Respondents	)	
	)	
Proceeding under Section 106(a)	)	<b>UNILATERAL ADMINISTRATIVE</b>
of the Comprehensive Environmental	)	<b>ORDER FOR OPERATION AND</b>
Response, Compensation, and Liability	)	<b>MAINTENANCE</b>
Act, 42 U.S.C. § 9606(a).	)	
	)	
	)	

**APPENDIX B**  
**STATEMENT OF WORK**  
**GRIGGS AND WALNUT GROUND WATER PLUME SUPERFUND SITE**  
**LAS CRUCES, NEW MEXICO**

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## I. Introduction

1. This Statement of Work (“SOW”) is Appendix B to the Order styled *In Re: Griggs and Walnut Ground Water Plume Superfund Site, Las Cruces, New Mexico; City of Las Cruces, and Doña Ana County, Respondents*, U.S. EPA Region 6 CERCLA Docket No. 06-15-16 (the “Order”).

2. The Griggs and Walnut Ground Water Plume Superfund Site (“the Site”) is located in the City of Las Cruces, Doña Ana County, New Mexico. The Site is listed in the U.S. Environmental Protection Agency (“EPA”) National Superfund Electronic Database.

3. The primary contaminant at the Site is dissolved perchloroethylene (“PCE”), a volatile organic compound. Dissolved PCE concentrations in ground water have ranged from below detection to a maximum detection of 70 micrograms per liter (µg/L) in CLC Well-18 in April 2012. For those wells with detections of PCE, the concentrations have averaged approximately eight µg/L based on samples collected since the ground water extraction system began operation in 2012. Under this SOW, the City of Las Cruces and Doña Ana County (Respondents) will extract and treat PCE contaminated ground water at the Site until all ground water samples obtained from within the plume boundaries exhibit concentrations of PCE less than five µg/L. Five micrograms per liter is the Maximum Concentration Limit (“MCL”) for PCE, established under the Safe Drinking Water Act, 42 U.S.C. §§ 300f – 300j-26.

4. In 2007, EPA estimated that the total mass of PCE within the designated plume boundaries was between 110 and 160 kilograms of PCE (between 242 and 357 pounds). EPA also estimated the volume of contaminated ground water with PCE concentrations greater than 5 µg/L requiring remediation was between 735 and 1,102 acre-feet (2.39 to 3.59 billion gallons). The total PCE mass was re-assessed by the JSP and reported to the EPA in 2013 with data collected since the RI/FS and ROD. Based on the results, Respondents estimated that the PCE mass was approximately 21.4 kilograms (2012-2013 System Operation and Remedial Action Progress Griggs-Walnut Ground Water Plume Superfund Site, October 2013).

5. EPA estimated in 2006 that the geographical extent of the PCE plume in the ground water is approximately 1.8 by .5 miles. The Site was defined by reference to soil vapor data and ground water sampling data with PCE contamination and detections. The detection of PCE in ground water begins at about 190 feet below ground surface (bgs). Based on data collected during the Remedial Investigation, the PCE contamination affects the local municipal water supply to depths of about 650 feet bgs. The Site contamination is located in the subsurface generally between East Griggs Avenue and East Hadley Avenue, in Las Cruces, Dona Ana County, New Mexico, extending east to beyond Interstate 25 (I-25), and west to beyond North Solano Avenue. PCE was detected at a maximum concentration of 18 µg/L east of I-25 at GWMW15-S in 2005 (Remediation Investigation Report Griggs-Walnut Ground Water Plume Superfund Site, November 2006). However, PCE was below detection in samples collected in 2012, 2013, and 2014 (2012-2013) System Operation and Remedial Action Progress Griggs-Walnut Ground Water Plume Superfund Site, October 2013; 2013-2014 System Operation and Remedial Action Progress Griggs-Walnut Ground Water Plume Superfund Site, December

2014). PCE was below the MCL in samples collected from all three zones of GWMW-15 in February 2014 (2013-2014 System Operation and Remedial Action Progress, December 2014). Based on those results, the Respondents conclude that the plume has retreated west of I-25.

6. In a June 18, 2007, Record of Decision (“ROD”), EPA selected a remedy to address ground water contaminated with PCE at the Site. Pursuant to an October 15, 2009, unilateral administrative order styled *In re: Griggs and Walnut Ground Water Plume Superfund Site*, U.S. EPA Docket No. 06-05-09 (hereinafter, the “Remedial Design Order”), Respondents collectively developed a Remedial Design for the implementation of EPA’s remedy selected in the ROD. EPA approved that Remedial Design. Pursuant to the Modified Administrative Order for Remedial Action, dated May 17, 2011, and styled *In re: Griggs and Walnut Ground Water Plume Superfund Site*, U.S. EPA Docket No. 06-02-11 (hereinafter, the “modified Remedial Action Order”) the City and County collectively constructed a ground water extraction and treatment system to remediate the contaminated ground water. Respondents have been operating this ground water extraction and treatment system since September, 2012.

## **II. Purpose**

7. Under this SOW, Respondents shall perform Pre-Achievement Operation and Maintenance (“O&M”) until the Remedial Action Objectives and Remediation Goals described in the ROD are attained. Once the Remedial Action Objectives and Remediation Goals are attained, Respondents shall perform Post-Achievement O&M until EPA issues a Certificate of Completion of the Work, as provided in Paragraph 54.b. of the Order.

## **III. Attendance at Meetings**

8. Respondents shall attend periodic project meetings as requested by EPA, unless otherwise agreed to in writing or through e-mail. The location of the meetings shall be decided by mutual consent of the Respondents and EPA.

## **IV. Community Involvement**

9. EPA has the lead responsibility for planning and implementing community involvement activities at the Site. EPA has developed a Community Involvement Plan (CIP) for the Site pursuant to 40 C.F.R. § 300.430(c). Community involvement activities may include conducting interviews with local officials, community residents, public interest groups, or other interested or affected parties, holding community meetings or open houses, and providing community fact sheets to the general public.

10. If requested by EPA, Respondents shall support EPA’s community involvement activities. This may include assisting in EPA’s efforts to plan and conduct community meetings and open houses, including procuring a meeting place, setting up the meeting room and visual aid equipment, preparing posters or other displays, and participating at the meeting or open house. It may also include assisting EPA in the preparation of EPA community fact sheets for distribution to the general public and providing copies of site documents to the EPA information repositories. EPA may describe, in its CIP, Respondents’ responsibilities for community involvement activities. All community involvement activities conducted by Respondents at EPA’s request are subject to oversight by EPA.

## **V. Pre-Achievement O&M**

### **A. Update Pre-Achievement Operation and Maintenance Plan**

11. No later than 90 calendar days after the Effective Date of the Order, Respondents shall submit for EPA's review and approval an Updated Pre-Achievement O&M Plan. This Updated Pre-Achievement O&M Plan shall include the following documents which the Respondents shall update, as necessary or as requested by EPA:

- a. Quality Management Plan - Respondents shall submit an updated Quality Management Plan ("QMP") that describes the policies and procedures for ensuring the quality of the Work to be performed under the Order, including this SOW. The QMP shall be prepared in accordance with EPA QA/R-2. The QMP shall describe the Respondents' quality system in terms of the organizational structure, functional responsibilities of management and staff, lines of authority, and required interfaces for those planning, implementing, and assessing the effectiveness of the quality system.
- b. Quality Assurance Project Plan - Respondents shall submit an updated Quality Assurance Project Plan ("QAPP"). The QAPP shall be prepared in accordance with the requirements in EPA QA/R-5 and guidance in EPA QA/G-5. As submitted previously, the QAPP may be included as an integrated portion of the SAP, along with the Field Sampling Plan ("FSP") that details the particulars of the sampling activities. The QAPP shall describe the project objectives and organization, functional activities, and quality assurance/quality control protocols that shall be used to achieve data quality objectives (DQOs). Respondents shall update the DQOs in accordance with EPA's guidance on the seven-step DQO process defined in EPA QA/G-4. In the QAPP, Respondents shall address sampling procedures, sample custody, analytical procedures, data validation, reporting and personnel qualifications.
- c. Sampling and Analysis Plan –
  - (1) Respondents shall submit an updated Sampling and Analysis Plan ("SAP"). The SAP shall define the specific objectives of data acquisition conducted during Pre-Achievement and Post-Achievement O&M. It shall include sampling equipment and procedures, sample handling, analytical methods, analytical parameters and contaminants. It shall also be written in a manner that ensures that sample collection and analytical procedures are conducted in accordance with technically acceptable protocols, as determined by EPA, and that the data meet DQOs. Respondents shall include updated DQOs in the SAP.

- (2) Respondents shall specify in the updated SAP that they shall, at least annually, collect and analyze water samples from the inflow and outflow points of the treatment system to ensure that the system's treated water meets the 5 µg/L MCL for PCE and other Performance Standards.
- (3) Respondents shall include with the updated SAP a description of the ground water monitoring program for characterizing the contaminated ground water plume over time. The updated SAP shall include the monitoring wells and monitoring frequencies identified in Tables 1 and 2 below, as well as the monitoring well locations, total depths and screened intervals for each well. It shall also include appropriate maps showing the location of previous and proposed new well sampling locations.

d. Ground Water Monitoring Plan

- (1) Respondents shall submit an updated Ground Water Monitoring Plan. The Ground Water Monitoring Plan shall describe the Site Ground Water Monitoring Program activities that Respondents shall conduct to adequately characterize the ground water contaminant plume(s) over time during operation of the ground water extraction and treatment system.
- (2) The Ground Water Monitoring Plan shall identify the monitoring wells to be used in the Ground Water Monitoring Program, including the location, total depth, and screened interval of each well, and the hydrologic zones or aquifers to be monitored, and the monitoring frequency. The Ground Water Monitoring Plan shall also describe the data to be collected to evaluate PCE mass removal, hydraulic containment and ground water quality as part of O&M (*see* Section V.D. of this SOW). The monitoring wells and frequencies of monitoring to be used in the Ground Water Monitoring Program shall include the wells and monitoring frequencies listed in Tables 1 and 2, below.

Table 1. Griggs Walnut Plume Sampling Monitoring Network

Well name	No. of Samples <sup>a</sup>	Baseline Chemistry Sample	Annual Chemistry Sample	Five-Year Review Chemistry Sample	Water level monitoring frequency
CLC 18	1	X	X		Monthly
CLC 26	1	X		X	Quarterly
CLC 27	1	X	X		Monthly
GWMW-01	7	X	X		Annual

GWMW-03	3	X	X		Annual
GWMW-06 Port 1	1	X		X	Annual
GWMW-06 Port 2	1	X		X	Annual
GWMW-08	5	X	X		Annual
GWMW-09	7	X	X		Annual
GWMW-10	7	X	X		Annual
GWMW-11-S	1	X	X		Annual
GWMW-11-I	1	X	X		Annual
GWMW-11-D	1	X	X		Annual
GWMW-15-S	1	X	X		Annual
GWMW-15-I	1	X		X	Annual
GWMW-15-D	1	X		X	Annual
GWMW-16-S	1	X	X		Annual
GWMW-16-D	1	X	X		Annual
MW-1 <sup>b</sup>					Annual
MW-3 <sup>b</sup>					Annual
MW-4 <sup>b</sup>					Annual
MW-5	1	X	X		Annual
MW-SF2	1	X	X		Annual
MW-SF5	1	X	X		Annual
MW-SF9	1	X	X		Annual
MW-SF10	1	X	X		Annual
NGMW-01 <sup>c</sup>	10	X			Annual
NGMW-02 <sup>c</sup>	9	X			Annual
NGMW-03	8 Baseline1 Annual	X	X		Annual

Note: a. Those wells listed as having multiple samples are multi-port wells, with the exception of NGMW-01, -02, and -03 which currently have passive diffusion bags placed at discrete depths within the well bore;

b. Water level data only for capture analysis;

c. Baseline samples to be collected and analyzed by EPA in 2015.

Table 2. Griggs Walnut Plume  
Regional Water Level Monitoring Network

Well name	Type	Water level monitoring frequency
Paz Park	Irrigation	Quarterly
CLC 10	Inactive	Quarterly
CLC 18	Capture	Monthly
CLC 19	Inactive	Quarterly
CLC 20	Inactive	Quarterly

CLC 21	Inactive	Quarterly
CLC 24	Inactive	Quarterly
CLC 26	Standby	Quarterly
CLC 27	Capture	Monthly
CLC 28	Active	Quarterly
CLC 38	Inactive	Quarterly
CLC 54	Inactive	Quarterly
CLC 57	Inactive	Quarterly
CLC 60	Inactive	Quarterly
CLC 61	Active	Quarterly

e. Institutional Control Implementation Assurance Plan

- (1) Respondents shall submit an updated Institutional Control Implementation and Assurance Plan (“ICIAP”) which describes how Respondents shall implement, maintain, monitor, and report on the Institutional Controls set forth in sections 9(A)(1) and (2) of the ROD. The Institutional Controls selected by EPA are government controls for temporarily restricting well drilling activities while ground water remediation is conducted to achieve the Remedial Action Objectives and provisions for notifying other local departments, state agencies, and authorities whenever a release occurs that may affect the Site ground water or remediation effort. The New Mexico Office of the State Engineer (“OSE”) has issued a moratorium on drilling in the remediation area. Respondents shall, in the ICIAP, describe procedures by which they shall periodically review the institutional controls to ensure that they are in place and effective.

- f. Data Management Plan - Respondents shall submit an updated Data Management Plan that outlines the procedures for storing, handling, accessing, retaining and securing data collected during O&M. The Data Management Plan shall also specify how data will be delivered to EPA. Respondents shall electronically supply all data to EPA and the New Mexico Environment Department (“NMED”) in a format as approved by EPA.
- g. Permitting Requirements and Compliance Plan - Settling Defendant shall submit an updated Permitting Requirements and Compliance Plan which describes how Respondents shall comply with all permitting requirements for the Work. Respondents shall coordinate and communicate with the appropriate federal or state permitting authorities to ensure all off-Site permitting requirements related to the Remedial Action are identified in the plan. The plan shall specify that Respondents shall submit copies of all permits, correspondence, and any notice of violations to EPA.

- h. Release Prevention Contingency Plan - Respondents shall submit an updated Release Prevention Contingency Plan that provides contingency measures for the cleanup of spills and discharges from materials handling or transport.
- i. Operation and Maintenance Contingency Plan Respondents shall submit an updated O&M Contingency Plan for the installation and operation of new ground water extraction wells and the discontinued operation of existing extraction wells, as required by SOW Paragraph 15, to optimize the performance of the ground water extraction and treatment system.

12. No later than 90 calendar days after the Effective Date of the Order, Respondents shall submit for EPA review an updated Health and Safety Plan (“HSP”) for O&M activities in conformance with applicable Occupational Safety and Health Administration (“OSHA”) and EPA requirements, including 29 C.F.R. § 1910, as a separate document from the Updated Pre-Achievement O&M Plan. EPA will not approve or disapprove the HSP, but will require compliance by the Respondents with its terms as part of the Order.

13. Respondents shall include in their Updated Pre-Achievement O&M Plan a schedule for the implementation of elements described therein, including a schedule for the implementation of all the tasks described in the plans listed in SOW Paragraphs 11.a through 11.i and SOW Paragraph 12.

14. Respondents shall assess the need to revise the Updated Pre-Achievement O&M Plan (including the schedule contained therein) on an annual basis throughout the performance of Pre-Achievement O&M, including the plans listed in Paragraphs 11.a through 11.i of this SOW. If Respondents determine that it is necessary to revise the Updated Pre-Achievement O&M Plan or schedule, or if EPA directs the Respondents to make revisions or updates, Respondents shall submit the revised Updated Pre-Achievement O&M Plan to EPA for review and approval no later than the next anniversary of the date that is 90 calendar days after the Effective Date. The O&M Contingency Plan shall be updated if the installation and operation of new extraction wells or the discontinued operation of existing extraction wells is recommended by Respondents or required by EPA. Respondents shall update the O&M Contingency Plan, including the pertinent parts of the schedule in the Updated Pre-Achievement O&M Plan described in SOW Paragraph 13, within 90 days of receipt of EPA’s notification that such new well(s) or the discontinued operation of the existing well(s) are required as stated in SOW Paragraph 25.

15. Respondents shall meet with EPA and NMED at least annually to discuss any revisions to the Updated Pre-Achievement O&M Plan, including the field sampling schedule, as part of the annual update of the SAP. The time and place of the meeting shall be mutually agreed upon by EPA, NMED and Respondents. Respondents shall meet with EPA and NMED more frequently if so requested by EPA.

## **B. Perform Annual Evaluation of Ground Water Monitoring Program**

16. Respondents shall perform an evaluation of the Site Ground Water Monitoring Program on an annual basis and submit for EPA review and approval a Ground Water Monitoring Evaluation Report of such program as part of the Annual O&M Report (*see* Section V.D. of this SOW). The purpose of this evaluation is to ensure that sufficient ground water data are being collected to assess whether operation of the extraction and treatment system is making adequate progress toward achieving the Remedial Action Objectives and Remediation Goals. Respondents shall undertake the following actions as part of this effort:

- a. Respondents shall conduct ground water modeling, as needed or as requested by EPA, to determine whether other well locations and other screening levels would more accurately characterize the contaminated ground water plume.
- b. Respondents may propose revisions to the list of wells specified in the EPA-approved Ground Water Monitoring Plan and submit the proposed revisions to EPA for review and approval as part of the evaluation report. Respondents shall propose a new monitoring well be installed if one is deemed necessary to adequately characterize and monitor the contaminated ground water plume over time.
- c. Respondents shall submit for EPA's review and approval a justification for any proposed revision to the approved list of monitoring wells or the frequency of sampling. The justification shall include the details of the status, function (*i.e.*, hydrogeologic zone, upgradient vs. downgradient position, static water level, ground water sampling, etc.), and sampling frequency of wells that are added to the monitoring network, as well as the rationale for excluding specific wells based on sampling strategy. Any proposed revision to optimize the monitoring well network for the evaluation of remedy performance shall be in accordance with the DQOs defined in the EPA-approved updated SAP.
- d. Respondents shall include with the annual evaluation report the appropriate maps depicting the locations of previous and proposed new monitoring well locations.
- e. Respondents shall update the Ground Water Monitoring Plan and SAP (including the schedule contained therein) as appropriate to be consistent with any revisions approved by EPA for the Ground Water Monitoring Program.

17. Upon review of the Ground Water Monitoring Evaluation Report described in Paragraph 16 of this SOW, EPA may require Respondents to add new or existing monitoring wells to the Ground Water Monitoring Program if EPA finds that:

- a. There is newly discovered site-related contamination in monitoring or water supply wells located beyond the identified horizontal or vertical boundary of the PCE plume that warrants additional monitoring wells (new or existing) to adequately delineate the extent of such contamination in a downgradient ground water flow direction or gravity-driven flow direction; or
- b. Ground water monitoring data indicate potential contaminant migration in a direction within the aquifer that cannot be adequately delineated with the existing monitoring well network.

For any new monitoring well required, EPA will identify the location, total depth screened interval, and monitoring frequency. EPA will discuss these new monitoring wells with Respondents and NMED and consider any concerns or objections expressed by Respondents or NMED before making any final determination as to the necessity of new monitoring wells in the Site Ground Water Monitoring Program. Once EPA decides that a new ground water monitoring well is needed, Respondents shall add the EPA-required monitoring well to the list of wells in the Ground Water Monitoring Plan and updated SAP.

18. Respondents shall complete any new monitoring well required by EPA at the location, depth, and screened interval identified by EPA within 180 calendar days after receipt of EPA's written request for the new well. EPA may adjust this required timeframe if necessary to accommodate Respondents' budgetary process for procuring the funds for well installation if so requested in writing and adequately supported by Respondents. All monitoring wells shall be installed according to the NMED Ground Water Quality Bureau monitoring well installation guidelines. Respondents shall submit to EPA and NMED a copy of the geologic boring log and well construction diagram within 60 calendar days of completion of the well.

19. Respondents shall collect and analyze ground water samples and take water level measurements from all the monitoring wells specified in the EPA-approved Ground Water Monitoring Plan, including those wells listed in Table 1 of this SOW, in accordance with the provisions and schedule of the EPA-approved updated SAP.

20. Respondents shall meet with EPA and NMED annually to discuss the Ground Water Monitoring Program. The time and place of the meeting shall be mutually agreed upon by EPA, NMED and the Respondents. Respondents shall meet with EPA and NMED more frequently if so requested by EPA.

### **C. Perform Pre-Achievement O&M**

21. After EPA reviews and approves the Respondents' Updated Pre-Achievement O&M Plan, including the schedules contained therein, Respondents shall operate and maintain the ground water extraction and treatment system and perform all other O&M activities by implementing the EPA-approved Updated Pre-Achievement O&M Plan according to the EPA-approved schedule.

22. Respondents shall perform all elements of the Updated Pre-Achievement O&M Plan including, but not limited to, the following:

- a. Identify/analyze potential operating problems;
- b. Review conformity with applicable performance and operations requirements;
- c. Review records, monitoring and reporting requirements;
- d. Review laboratory analytical reports, including analytical methods, procedures and data validation, to ensure consistency with the QAPP;
- e. Review integrity and continued functionality of ground water extraction and treatment system;
- f. Perform periodic evaluations to optimize system performance; and
- g. Perform the Ground Water Monitoring Program, including the annual evaluation.

23. At the time of the ROD, EPA expected that the successful performance of the remedy will require the installation and operation of a least one new extraction well (*see* the ROD, which is Appendix A to the Order at p. 104 (Major Components of the Selected Remedy)). EPA also expected that the successful performance of the remedy may require discontinuing the operation of some existing extraction wells. Respondents shall perform the installation and operation of one new extraction well and/or discontinuation of the use of any existing extraction wells if EPA determines, on the basis of all available information, including seeking input from Respondents, that such actions are appropriate to optimize contaminant mass removal rates and plume capture for the effective and efficient reduction of PCE concentrations to or below the MCL of 5 µg/L at the Site over time. Respondents shall complete the installation and operational start-up of one new extraction well required by EPA in accordance with the schedule approved by EPA (*see* SOW Paragraph 27, below). If EPA determines, on the basis of all available information, including seeking input from Respondents, that the installation and operation of more than one new extraction well is necessary to achieve remediation goals as specified in the ROD, EPA will prepare and provide to Respondents an amendment to the SOW specifying such requirements. Provided that any additional extraction well is within the scope of the ROD and necessary to achieve the remediation goals as specified in the ROD, Respondents shall complete the installation and operational start-up of the new extraction well required by EPA in accordance with the schedule approved by EPA.

24. To ensure that Respondents are removing the mass of contaminants in the aquifer in an effective and efficient manner, each year, as part of the annual O&M reporting requirements (described in Paragraph 28 of this SOW), Respondents shall perform a optimization assessment in which the Respondents shall recommend to EPA whether any

changes to the ground water extraction system are needed in order to optimize its performance.<sup>1</sup> EPA will consider these recommendations as it makes its decision regarding optimization. In making this recommendation, Respondents shall consider whether any of the following conditions at the Site have been observed by EPA, the State of New Mexico (“State”), or Respondents:

- a. The annual estimated PCE mass removal rate (kg/year) decreases significantly, as compared to the estimated PCE mass removal rate for the prior year of operation, recognizing that mass removal rates are expected to decrease as the remedy approaches completion;
- b. There are known or suspected shortcomings with respect to plume capture, such as: (a) newly discovered Site-related contaminants in monitoring or water supply wells located beyond the identified boundary of the PCE plume; or (b) increasing concentration trends of Site-related contaminants in downgradient wells;
- c. The updated ground water modeling predictions or other analyses show that the extraction system is not capturing sufficient PCE to reach Remediation Goals within the 14-year time period estimated in the ROD. Fourteen years shall be measured from the Effective Date of this Order.
- d. The rate of reduction of the size or overall concentration of the PCE plume is too low to meet Remediation Goals with the 14-year time period estimated in the ROD. Fourteen years shall be measured from the Effective Date. Respondents shall estimate the rate of reduction of the plume size using annual PCE isoconcentration contour maps for each aquifer zone. Respondents shall estimate the rate of reduction of the overall concentration of the plume using concentration trends of contaminants depicted in time-series plots (or other graphical representations) for all monitoring wells.

25. If, following a review of Respondents’ optimization assessment recommendation and the Site conditions, EPA determines that optimization is needed, EPA will so notify the Respondents and the Respondents shall submit for EPA’s review and approval an Optimization Report that details the recommended changes to optimize the ground water extraction system within 60 days of EPA’s determination. In the Optimization Report, Respondents shall provide the following:

- a. An assessment as to whether the additional extraction well(s) should be installed to optimize contaminant mass removal or optimize capture of the PCE plume;
- b. If the installation and operation of the new extraction well(s) is shown to be necessary by the assessment as determined by EPA, a description of the

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<sup>1</sup> Performance is optimized when the system is obtaining the best result toward reaching the Performance Standards (or other Requirements of this Order) under the circumstances at a given point in time, as determined by EPA.

proposed new extraction well location(s), the proposed depth of the well(s), the proposed screening interval(s), and the hydrologic zone(s) in which the well(s) will be completed;

- c. An assessment as to whether the operation of any existing extraction well(s) (*i.e.*, any extraction well that exists at the time of the assessment) should be discontinued to optimize contaminant mass removal in other wells or to optimize capture of the PCE plume; and
- d. If discontinuation of the operation of any existing extraction well(s) is shown to be necessary by the assessment as determined by EPA, a list of those extraction wells proposed for discontinuing operations, including, where appropriate, a request to close such wells.

26. Upon review of the Optimization Report, EPA will determine whether new extraction wells must be constructed or existing extraction wells must be discontinued and so notify Respondents. If EPA determines, on the basis of all available information, including seeking input from Respondents, that the installation and operation of more than one new extraction well is necessary to achieve the remediation goals as specified in the ROD, EPA will prepare and submit to Respondents an amendment to the SOW as described in SOW Paragraph 23. Respondents shall include EPA's determination and the information presented in the Optimization Report in the updated O&M Contingency Plan described in SOW Paragraph 27.

27. Respondents shall prepare and submit an updated O&M Contingency Plan to EPA for review and approval within 90 days of receipt of EPA's notification that the new extraction well(s) or discontinuation of operation of the existing extraction well(s) is required to optimize the performance of the remedy. When an updated O&M Contingency Plan is submitted, Respondents shall describe in the O&M Contingency Plan any Work that Respondents shall undertake to (a) install additional extraction wells described in the Optimization Report required under SOW Paragraph 25, or (b) discontinue the operation of any existing extraction wells listed in the Optimization Report required under SOW Paragraph 25. In the updated O&M Contingency Plan, Respondents shall include for EPA review and approval a schedule by which Respondents shall complete the Work described in this SOW Paragraph. Once EPA has reviewed and approved the O&M Contingency Plan, Respondents shall implement the O&M Contingency Plan according to the schedule contained therein.

#### **D. Provide Annual O&M Reports**

28. Beginning 90 calendar days after the Effective Date of this Order, and annually thereafter on the anniversary of the date that is 90 calendar days after the Effective Date, Respondents shall submit, for EPA's review and approval, an Annual O&M Report that includes:

- a. A description of progress made toward achieving Performance Standards, including a description of all actions that have been taken toward completing the tasks described in the Updated Pre-Achievement O&M Plan during the previous year;

- b. A system operating performance evaluation, including:
  - (1) A description of all O&M activities performed the previous year;
  - (2) A site location map;
  - (3) A site layout and performance monitoring well location map showing the location of water treatment system and all municipal water supply wells (pumping wells) and monitoring wells;
  - (4) Process flow diagram(s) for the water treatment plant;
  - (5) A summary of operational data, including total run time, percent run time, discussion of down time, average pumping rate per well (gallons per minute), ground water volumes pumped and treated (total and individual well basis) per day, calculations for mass removal, and inflow and outflow water chemistry at the water treatment plant; and
  - (6) A summary of maintenance records;
- c. A ground water hydrologic evaluation, including:
  - (1) A description of all ground water monitoring activities performed the previous year;
  - (2) Water level data for each well;
  - (3) Potentiometric surface or ground water surface elevation contour maps for each hydrogeologic zone showing ground water flow directions and gradients;
  - (4) A graph of the pumping wells' water levels over time; and
  - (5) An analysis of acquired water level data and maps to define flow direction and hydraulic gradients in the plume area.
- d. A ground water quality evaluation, including:
  - (1) A description of ground water sampling performed the previous year;
  - (2) A copy of all field notes taken the previous year by field sampling teams, including those by contractors or subcontractors;
  - (3) Ground water chemistry data summary tables;
  - (4) Isoconcentration contour maps for PCE showing aerial extent of contaminant plume(s) in each hydrogeologic zone and all

monitoring well and municipal water supply well data points used in the mapping assessment;

- (5) Hydrogeologic cross sections showing stratigraphy, hydrogeologic zones, water levels, and horizontal and vertical extent of contamination;
  - (6) A map showing location of all cross sections;
  - (7) A graph of contaminant concentrations over time per well for all monitoring and extraction wells; and
  - (8) An analysis of water quality data, ground water modeling and mapping effort performed to define the vertical and horizontal extent of the ground water plumes;
- e. An optimization assessment of the ground water extraction well network performance and an evaluation of the need for installing and operating new extraction wells or discontinuing operation of existing extraction wells to optimize contaminant mass removal rates and PCE plume capture for improving the overall effectiveness and efficiency of the system;
  - f. Laboratory analytical data;
  - g. A ground water monitoring program evaluation report (*see* Section V.B. above);
  - h. A description of all permitting or other regulatory activities (*e.g.*, Safe Drinking Water Act requirements), if any, performed during the previous year related to this Work and compliance with permit requirements or notification of permit violations;
  - i. A description of any problems or difficulties encountered in operating or maintaining the ground water extraction and treatment system and how they were solved or if they remain unresolved and their recommended solutions; and
  - j. The status of all Deliverables required by the Order, including this SOW, and a description of the Deliverables submitted during the previous year.

29. Respondents shall meet with EPA and NMED annually to discuss the Annual O&M Report, any EPA comments on the Annual O&M Report, and the overall progress made in achieving the Remedial Action Objectives and Remediation Goals. This meeting should coincide with the annual meeting on the ground water monitoring program required in Paragraph 20 of this SOW. The time and place of the meeting shall be mutually agreed upon by EPA, NMED and the Respondents. Respondents shall meet with EPA and NMED more frequently if so requested by EPA.

30. Respondents shall continue to perform Pre-Achievement O&M and submit to EPA for review and approval, with a copy to NMED, the Annual O&M reports and any revised updated Pre-Achievement O&M plans, as described in SOW Section V.A., B., C., and D above, until EPA provides Respondents with a Certificate of Completion of the Pre-Achievement O&M as provided in Paragraph 54.a. (Completion of Pre-Achievement O&M) of the Order. Once EPA provides Respondents with a Certificate of Completion of the Pre-Achievement O&M, Respondents shall perform Post-Achievement O&M according to the EPA approved Post-Achievement O&M plan described in SOW Section VI (Post-Achievement O&M).

## **VI. Post-Achievement O&M**

31. No later than 90 days after the second 5-year review, Respondents shall revise and update the August 14, 2012, document entitled Post-Achievement Operations and Maintenance Plan Griggs-Walnut Ground Water Plume Site, and submit the updated document to EPA for review and approval. In this updated Post-Achievement O&M Plan, Respondents shall set forth a Plan to ensure that the Remedial Action Objectives and Remediation Goals at the end of Pre-Achievement O&M are maintained over time. Once this submission is approved by EPA, it shall be referred to as the Final Updated Post-Achievement O&M Plan. Respondents shall include the following elements in the proposed Final Updated Post-Achievement O&M Plan:

- a. The August 14, 2012, document entitled Post-Achievement Operations and Maintenance Plan Griggs-Walnut Ground Water Plume Site, with updates or revisions as appropriate or as requested by EPA;
- b. A plan describing how Respondents shall undertake Post-Achievement ground water monitoring to ensure that the remedy remains protective. Respondents shall propose in the plan a list of Post-Achievement monitoring wells for this purpose, including a subset of wells that Respondents shall sample quarterly until such time as they have demonstrated, to EPA's satisfaction, that they have achieved eight consecutive quarters of compliance, consistent with State monitoring requirements (*see* Paragraph 32 of this SOW);
- c. Procedures describing how Respondents shall periodically review institutional controls to ensure that they are in place and effective;
- d. A plan describing how Respondents shall annually report and document in an **Annual Post-Achievement O&M Report** the progress of Respondents' implementation of Post-Achievement O&M, including all the elements described in this SOW Paragraph 31 at a. through c., in accordance to the schedule submitted by Respondents as described in SOW paragraph 31.e. once it is approved by EPA; and
- e. A schedule for the implementation of Post-Achievement O&M, including the elements described in this Paragraph 31 at a. through d.

32. Once EPA provides Respondents with a Certificate of Completion of the Pre-Achievement O&M as provided in paragraph 54.a. (Completion of Pre-Achievement O&M) of

the Order, then Respondents shall perform the Work described in the Updated Post-Achievement O&M Plan according to the EPA-approved schedule described therein. As part of Post-Achievement O&M, Respondents shall annually submit for EPA review and approval the Annual Post-Achievement O&M Report described in Paragraph 31.d above, in accordance with the EPA-approved schedule described in Paragraph 31.e above.

33. Respondents shall perform Post-Achievement O&M until monitoring data show that the attainment of Remedial Action Objectives and Remediation Goals has continued for a period of not less than five consecutive years. This consecutive five-year demonstration shall include eight consecutive quarterly samples, collected by wells identified by EPA in consultation with NMED, consistent with State monitoring requirements. As stated in SOW Paragraph 31.b. above, Respondents shall propose, for EPA's approval, a select number of wells to meet the State's quarterly sampling requirements. Respondents may include in such list any Site area wells planned to be sampled by the State.

34. **Completion of Post-Achievement O&M/Completion of the Work.** *See* Paragraph 54.b. (Completion of Post-Achievement O&M/Completion of the Work) of the Order.